

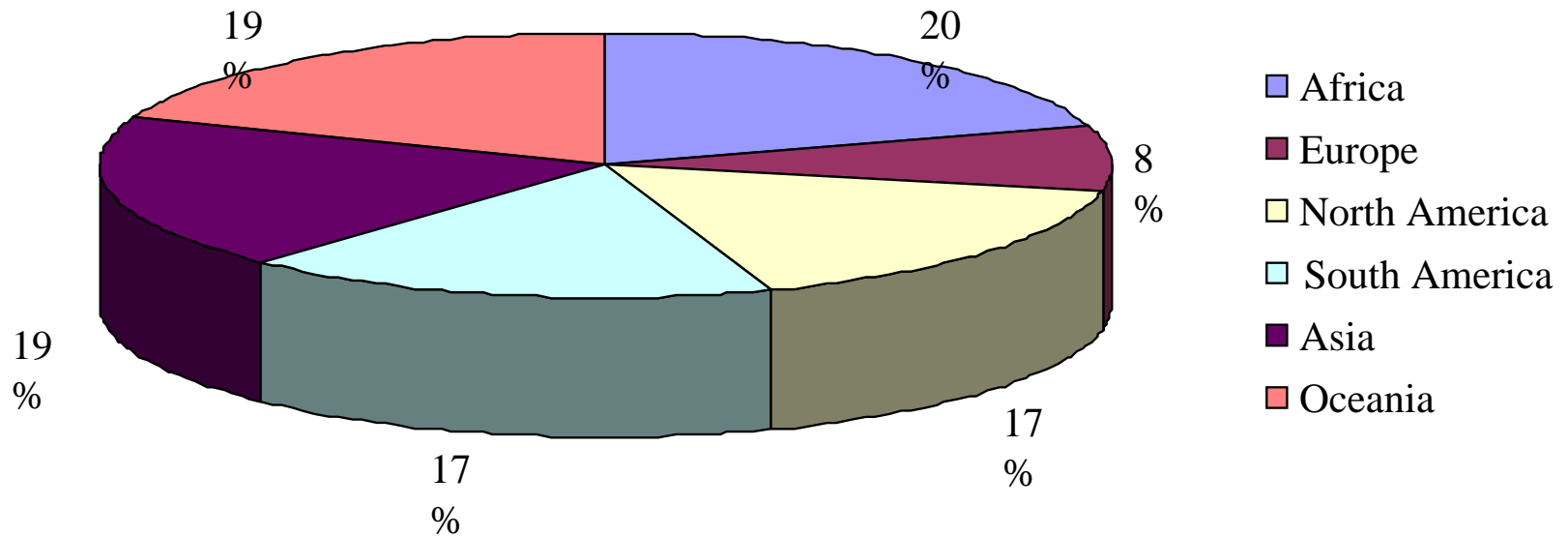
Life Cycle Inventories in the Artisanal and Small-Scale Mining in South America–Peruvian Case Studies

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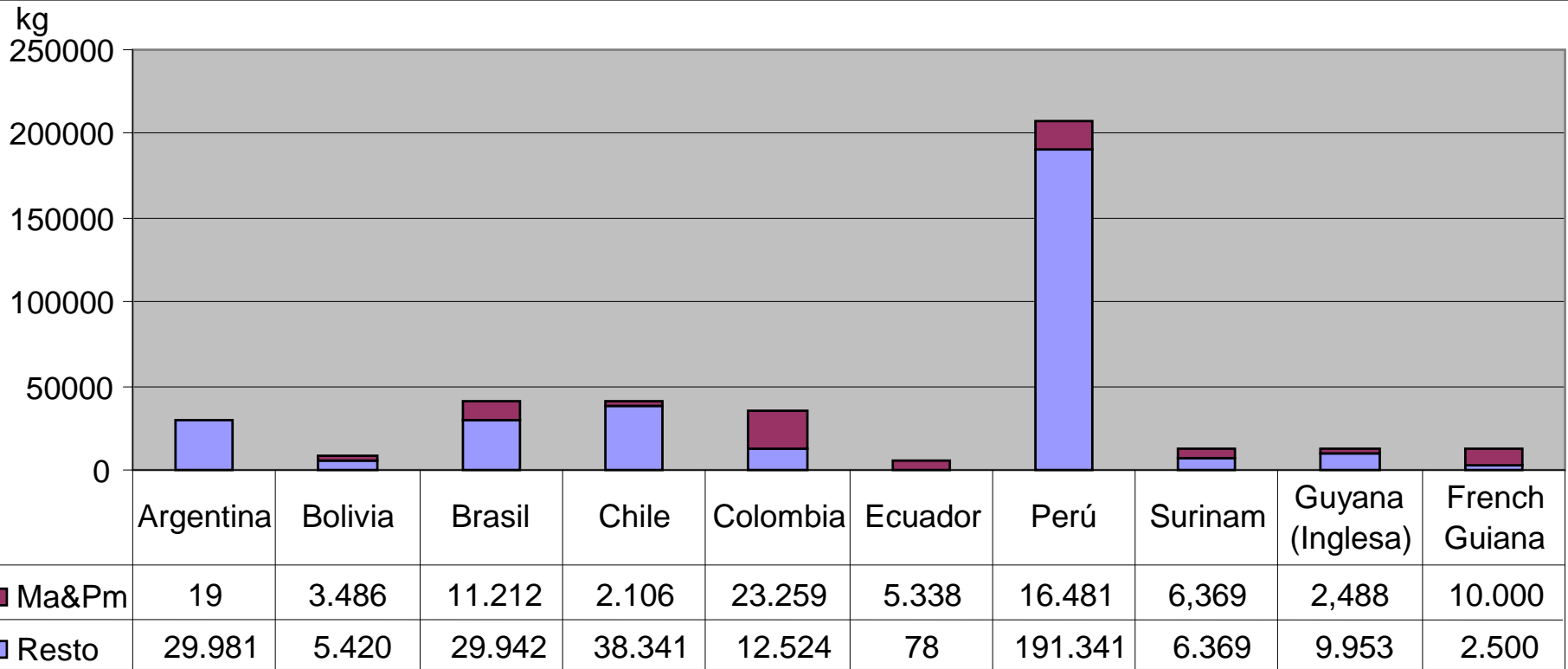


CONTEXT

Gold production worldwide - 2006



Gold production in South American countries: Total and from artisanal and small-scale activities (Ma&Pm) - 2005 (kilos)

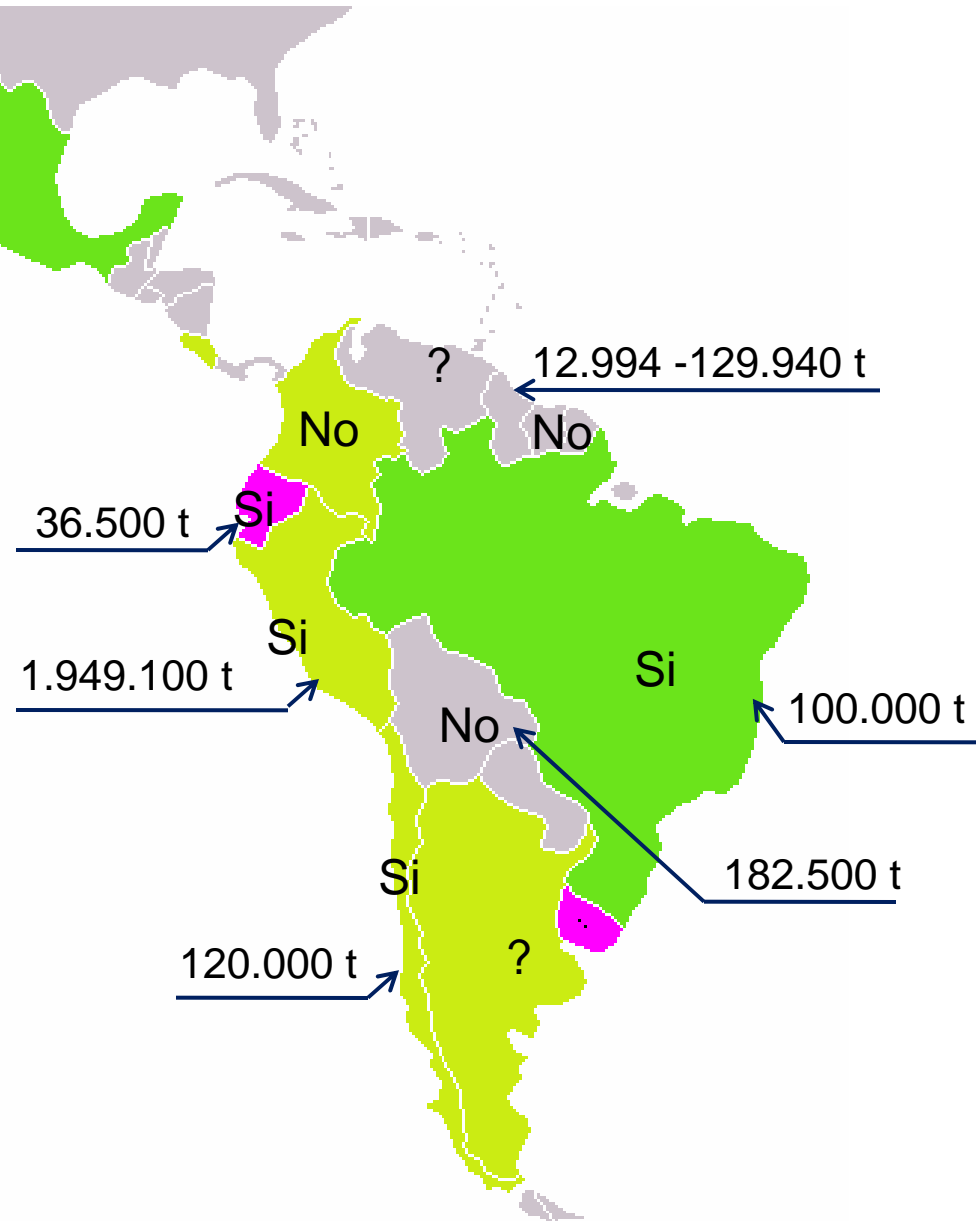


Source: Valdivia, 2008



Existing legislation on small-scale and artisanal mining in South-America

- Level 3: network, some regulation
- Level 2: network, basic regulation
- Level 1: 1-2 experts identified – no network
- Unknown



Source: Valdivia, 2008



Peruvian Cases

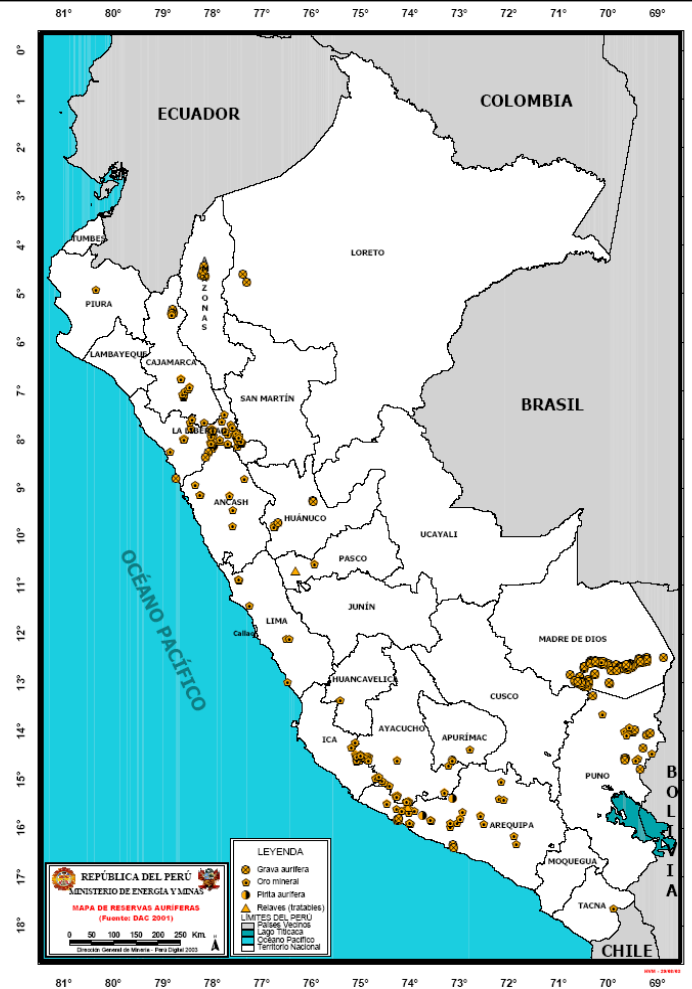
Aims of the research

- To elaborate two LCIs for gold production under small scale and artisanal mining
- To discuss the methodology used and results
- To identify common environmental parameters
- To discuss the representativeness of results for the Southamerican region



Cases Studies

Caso 1: Small-scale mining. Gold aluvial mining (99.5%), located in Mazuco – Madre de Dios, Amazon Region.
Ore Grade: 1.00466 g Au in 15 m³ of aluvial sand



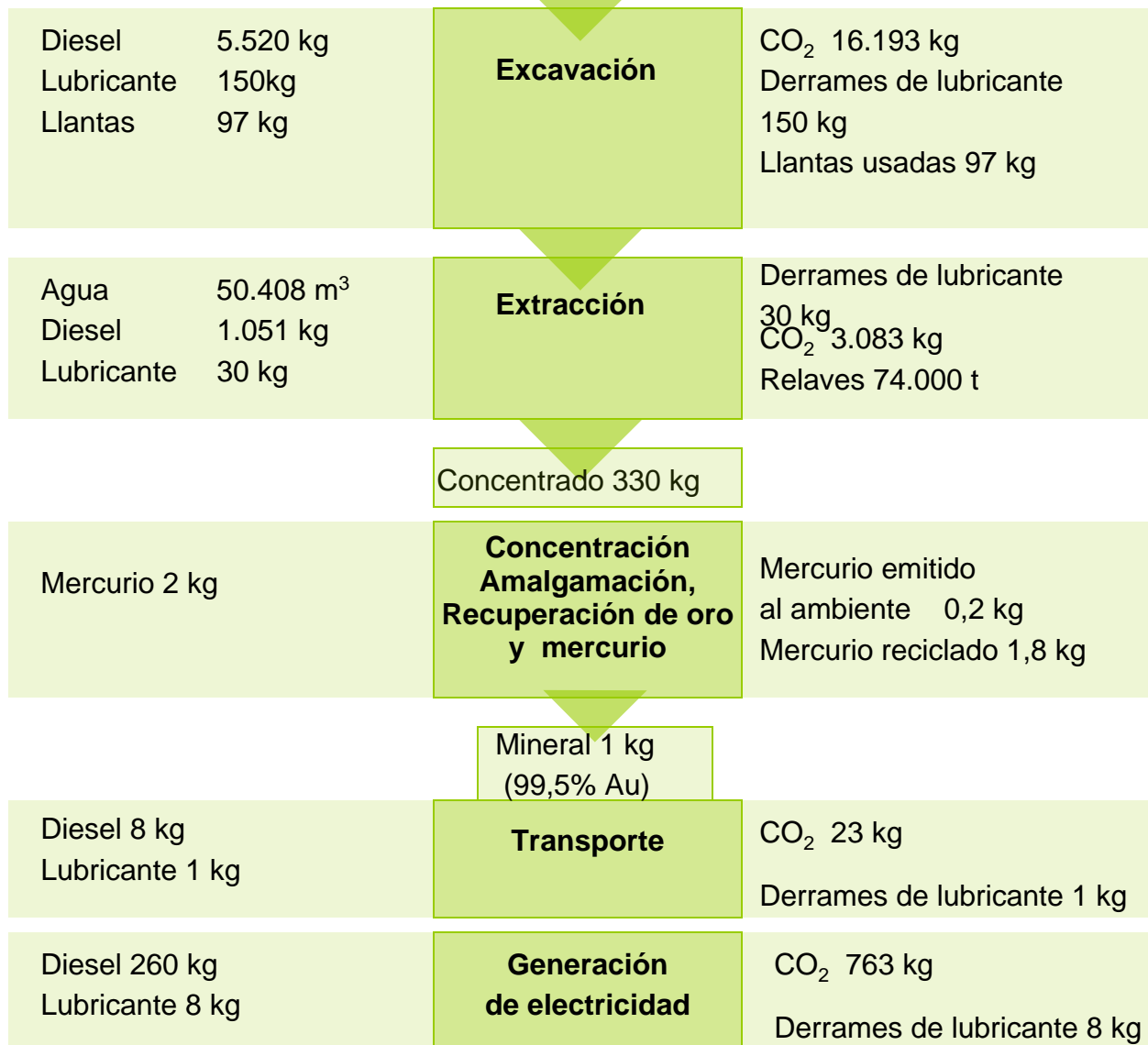
Caso 2: Artisanal-scale mining. Gold underground mining (80%) located in Lucanas - Ayacucho, Andean Region
Ore grade: 133 g Au per TN.



Foto satelital del conglomerado de actividades mineras de la Asociación SOTRAMI

Case 1: Mazuco – Madre de Dios

Mineral 23.922t
 Suelo transformado 373 m²
 Suelo ocupado 16.125 m²a



Resources and Emissions per 1 Kg Gold

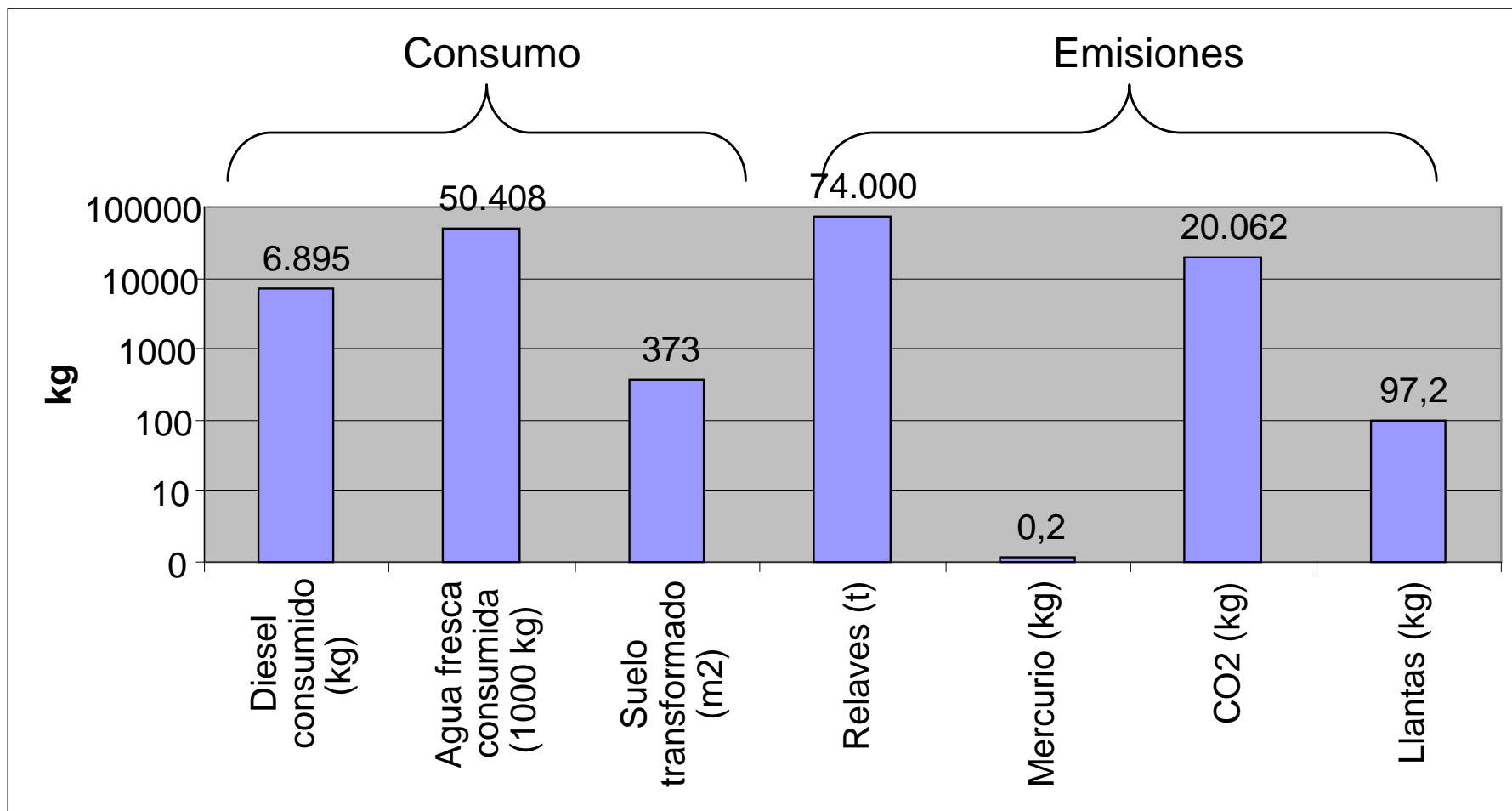
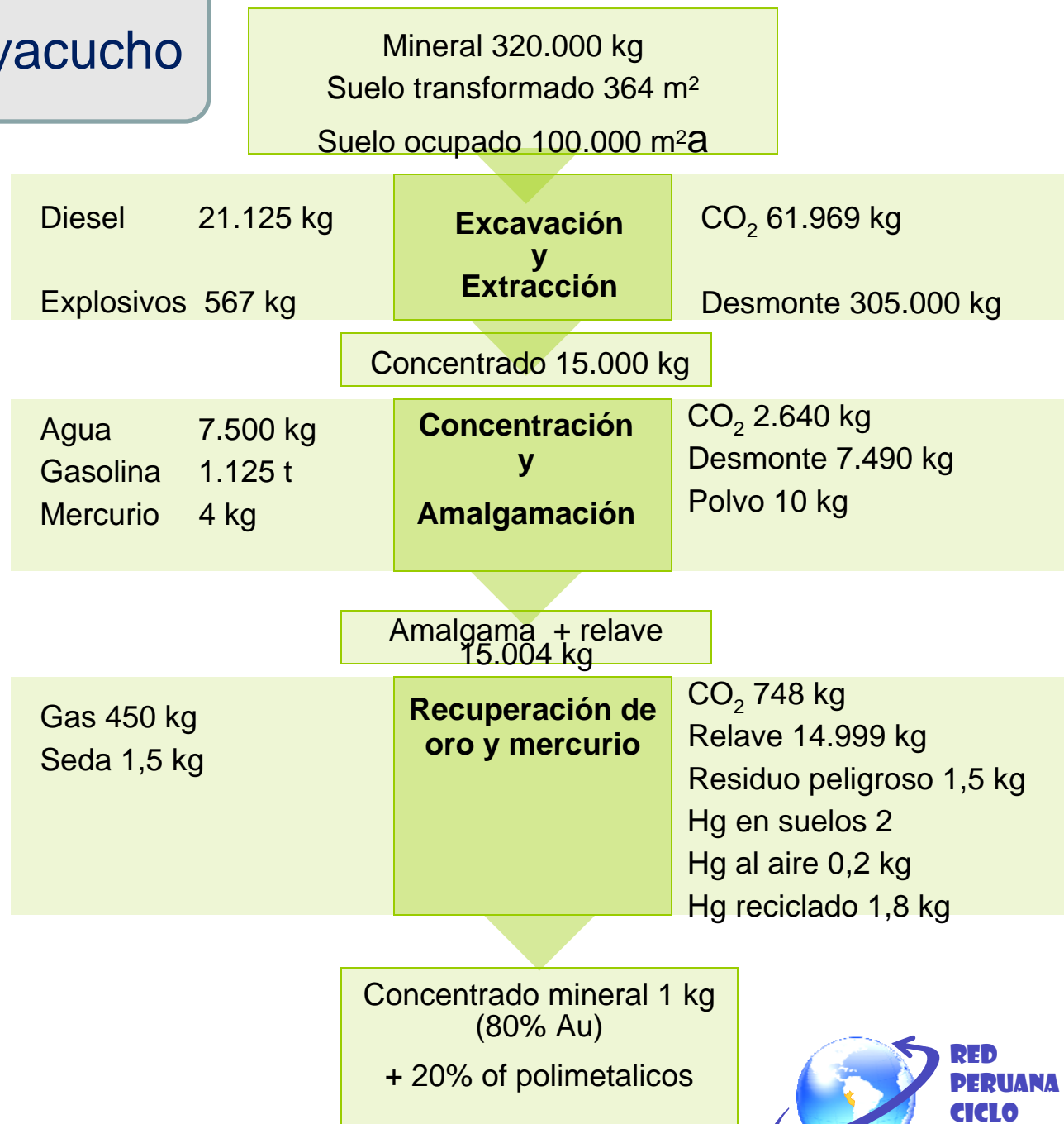


Figura 8: Consumos y emisiones de la obtención de 1 kilo de oro (99,5%) – caso #1

Case 2: Lucanas - Ayacucho



Resources and Emissions per 1 Kg Gold

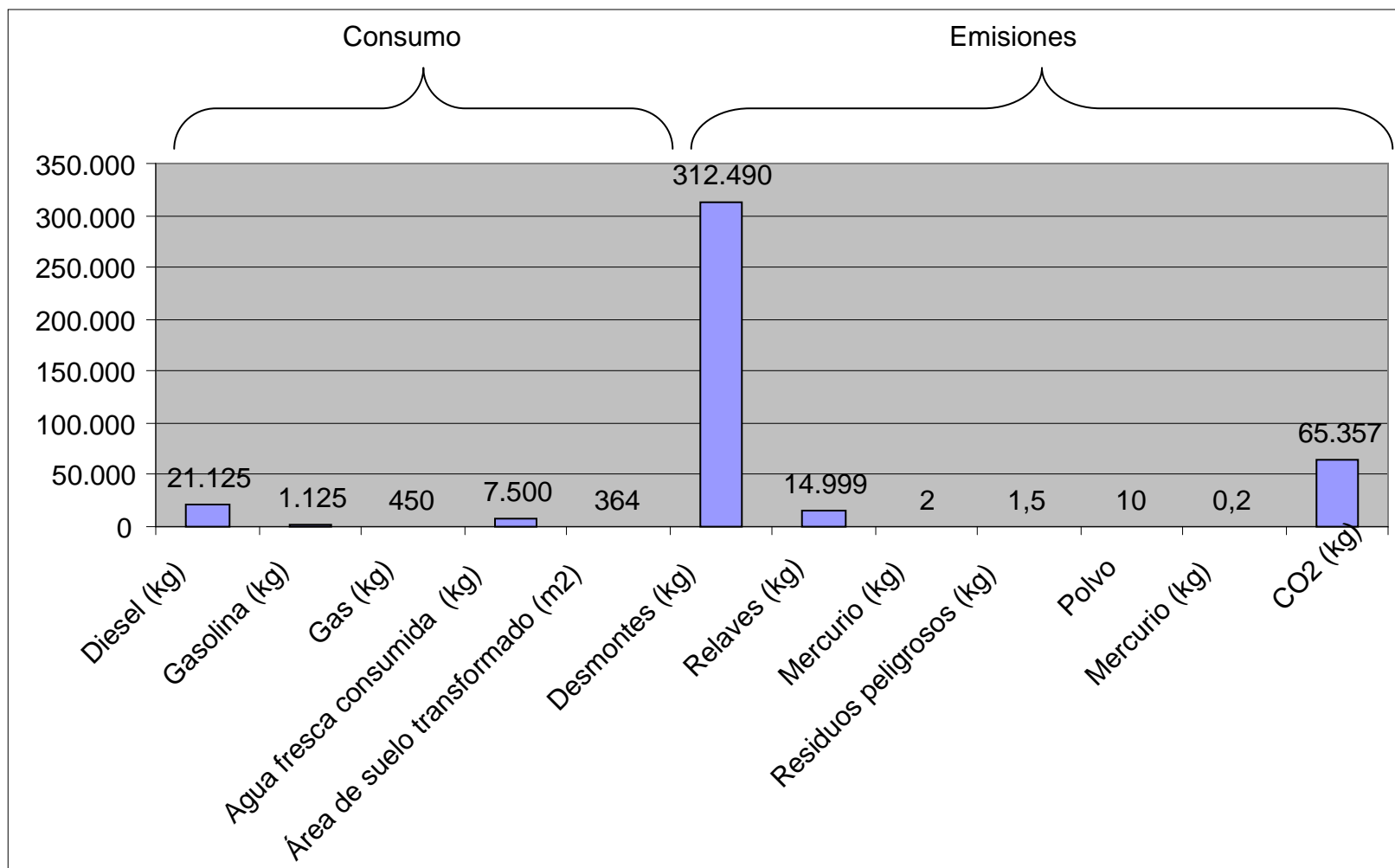
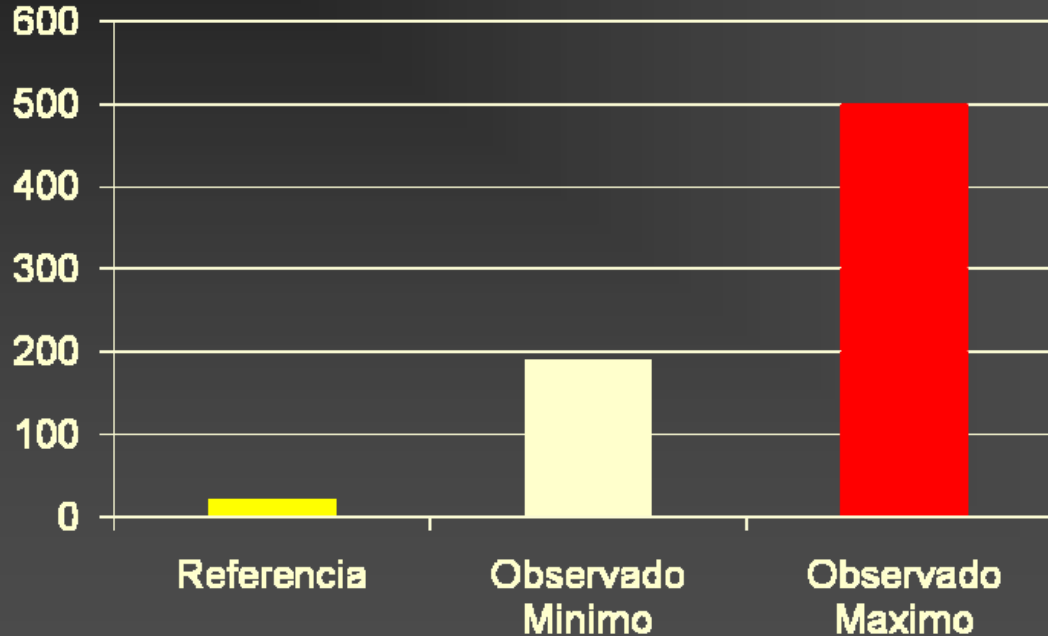


Figura 9: Consumos y emisiones de la obtención de 1 kilo de oro (80,0%) – caso #2

Observaciones iniciales

Puerto Moldonado

Concentracion de Mercurio (mcg/m³)
A dentro de las tiendas de oro durante la quema



Referencia Maximo de Aire Ocupacional (industrial) OSM: **20 mcg/m³ Mercurio**
(WHO occupational maximum)

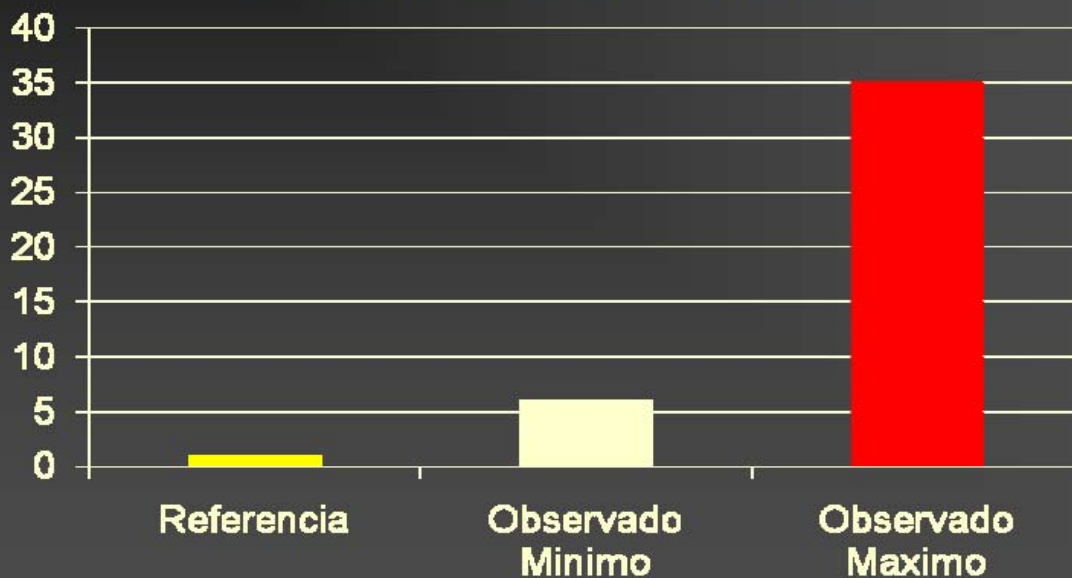


Mercury Concentration “in front of” gold production sites - Amalgamation

Observaciones iniciales

Puerto Maldonado

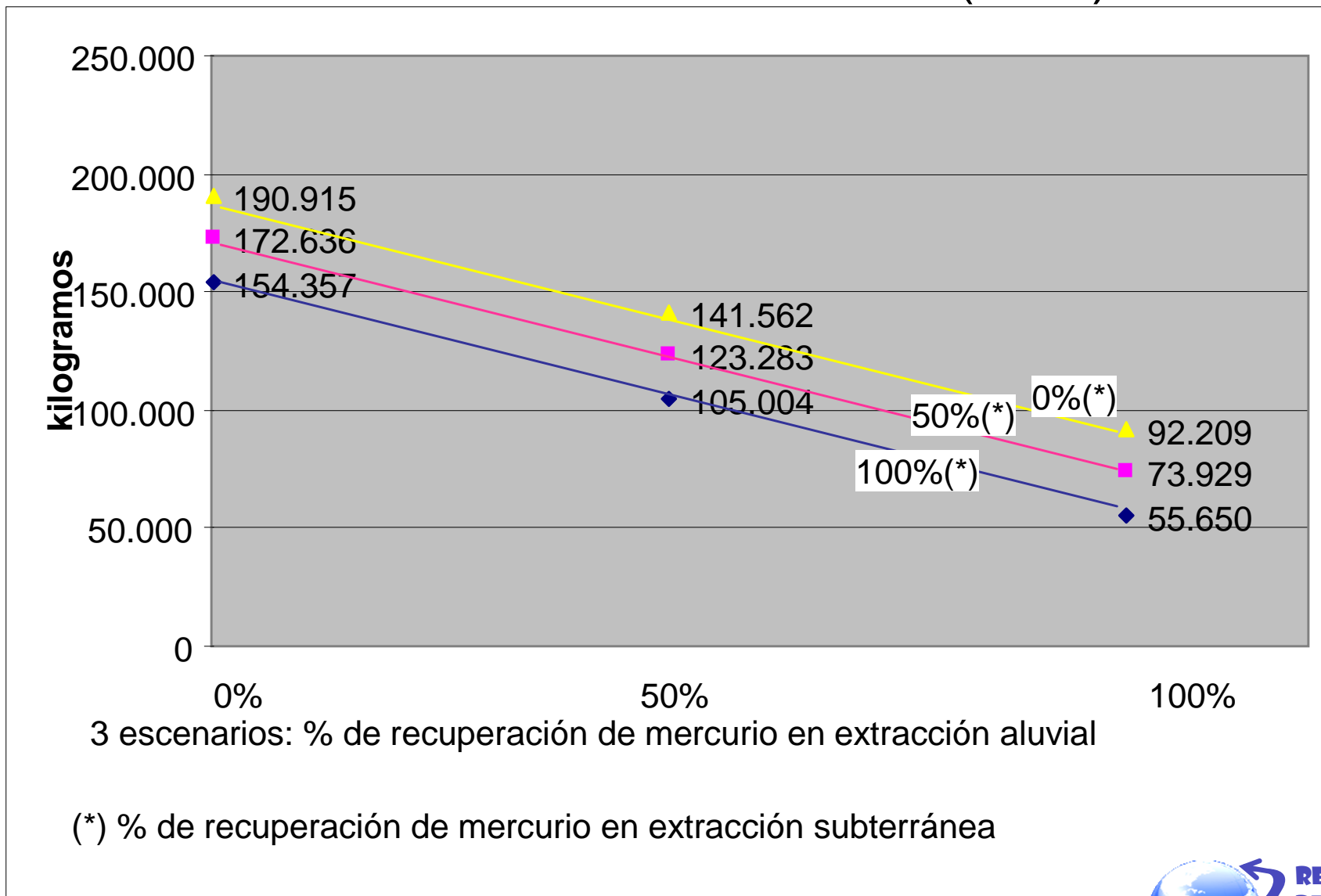
Concentracion de Mercurio (mcg/m³)
Al frente de las tiendas – aire libre



Referencia Maximo de aire ambiental (OSM): **1 mcg/m³ mercurio**



Mercury released to the Environment in 7 South American countries - 2005 (kilos)



Conclusions

- Common environmental parameters: Emissions of mercury, land use and water consumption.
- To make LCI in another countries of the Latin American region where the participation of small and artisanal mining is important via national networks.
- According to this study, it is important analyze cases in Colombia, Equator and Bolivia for the purpose to encourage the establishment of legislation.



Stakeholders concerned

- International organization: upcoming global Mercury Convention to be published following the decision of Governments on 20 Feb 2009.
- Local Governments
- Small Mining Associations
- Ministries of Mining
- Owners of small-scale and artisanal extractive mining activities
- NGOs



Thank you

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